

CHAPTER 2

DESCRIPTION OF THE BARREN RIVER WATERSHED

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2.1. BACKGROUND. The Barren River and Watershed are named for the Barrens, the meadowlands that are predominant in the watershed. The Barren River Watershed appears to be in the Cumberland River Basin, but it is not. Water in the watershed flows to the Green River, then to the Ohio River.

This Chapter describes the location and characteristics of the Barren River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Barren River Watershed is located in Middle Tennessee and includes parts of Clay, Jackson, Macon, and Sumner Counties.

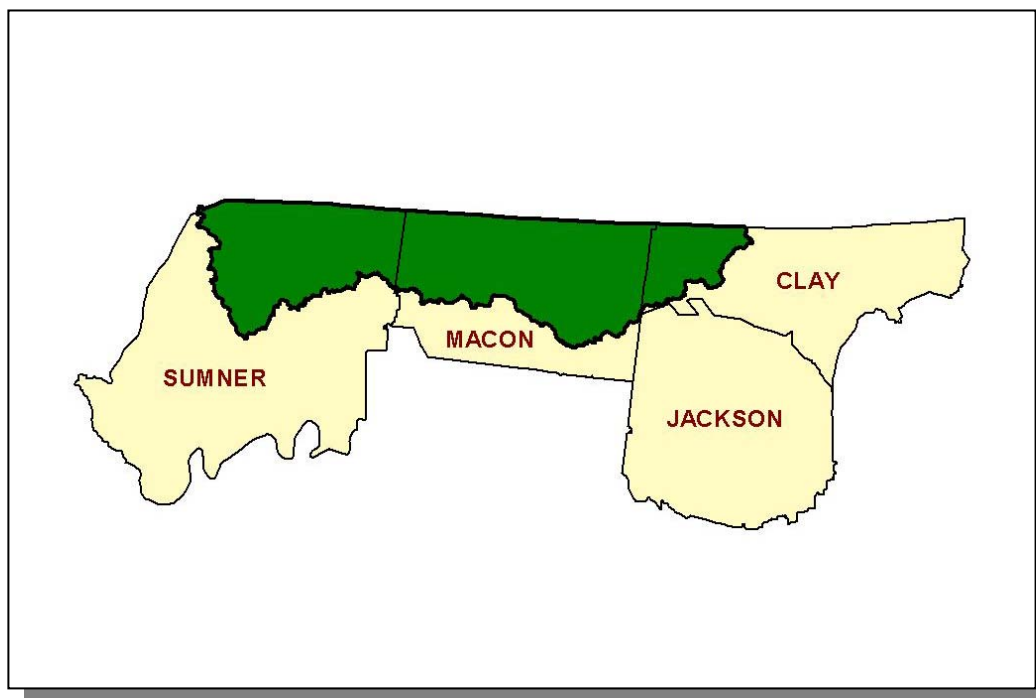


Figure 2-1. General Location of the Tennessee Portion of the Barren River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Macon	50.2
Sumner	37.4
Clay	12.4

Table 2-1. The Barren River Watershed Includes Parts of Three Middle Tennessee Counties.

2.2.B. Population Density Centers. Nine highways serve the major communities in the Tennessee portion of the Barren River Watershed.

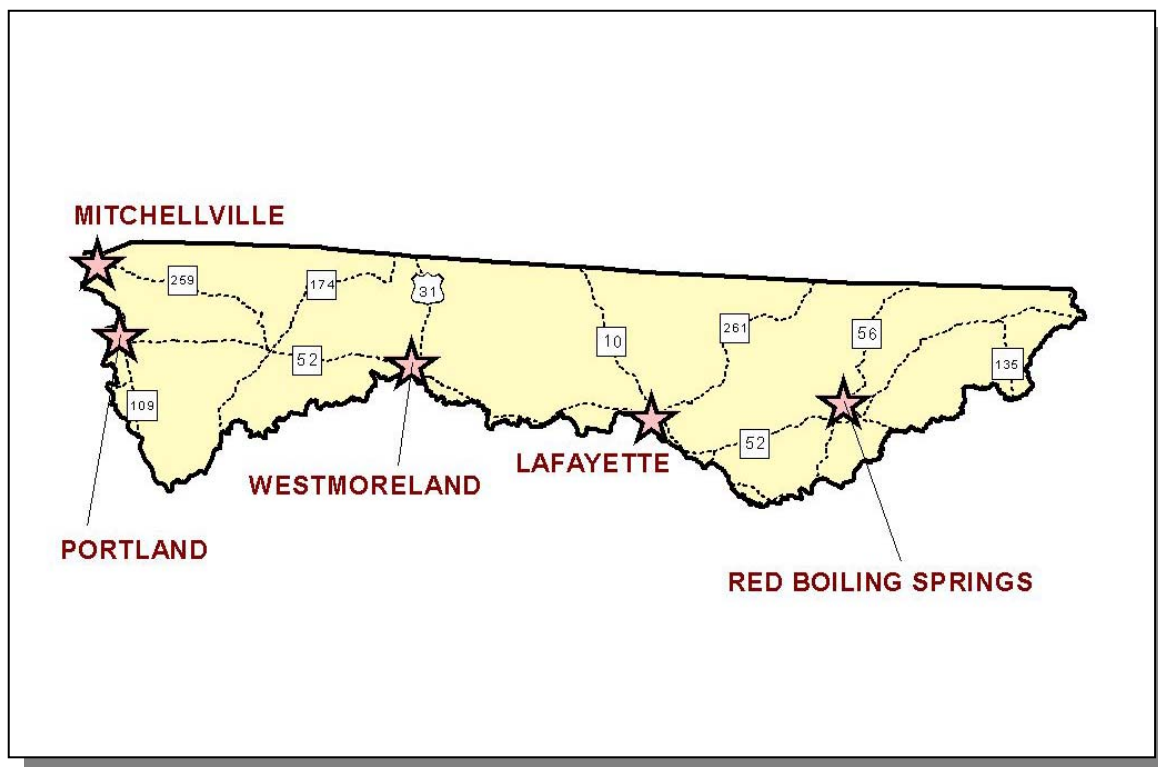


Figure 2-2. Communities and Roads in the Tennessee Portion of the Barren River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Portland	8,462	Sumner
Westmoreland	2,093	Sumner
Red Boiling Springs	1,023	Macon
Mitchelville	207	Sumner
Lafayette*	136	Macon

Table 2-2. Municipalities in the Tennessee Portion of the Barren River Watershed. Population based on 2000 census (Tennessee Blue Book) or <http://www.hometownlocator.com>. Asterisk (*) indicates county seat.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Barren River Watershed, designated 05110002 by the USGS, is approximately 1,661 square miles (432 square miles in Tennessee) and drains to the Green River.

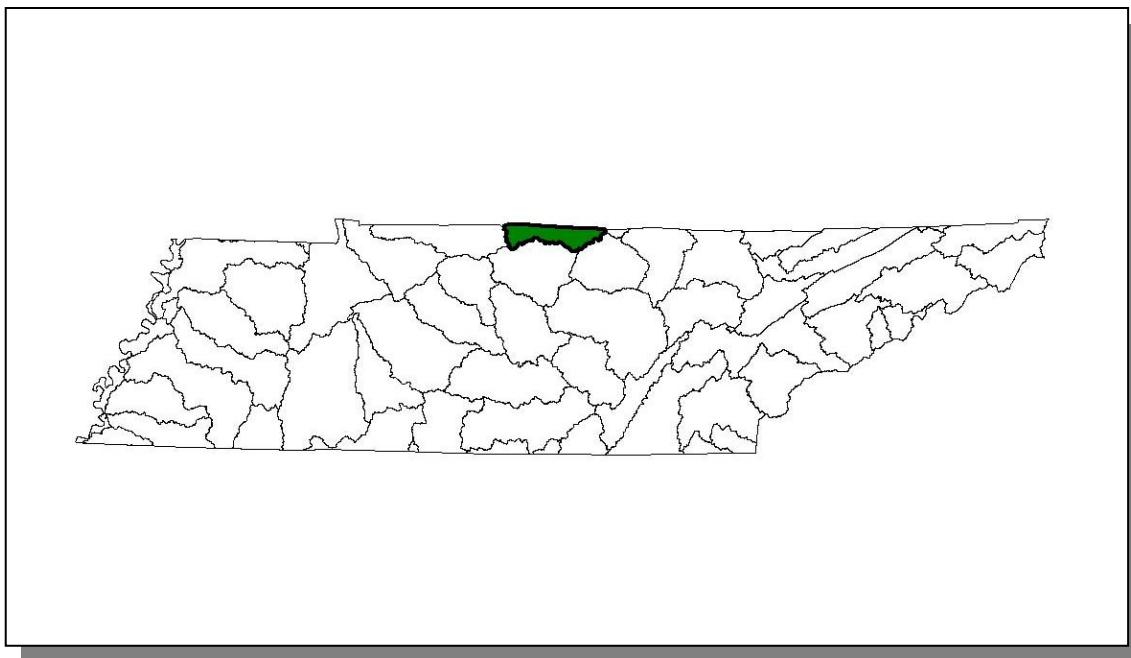


Figure 2-3. The Barren River Watershed is Part of the Green River Drainage in Kentucky; it is not Part of the Cumberland River Basin.

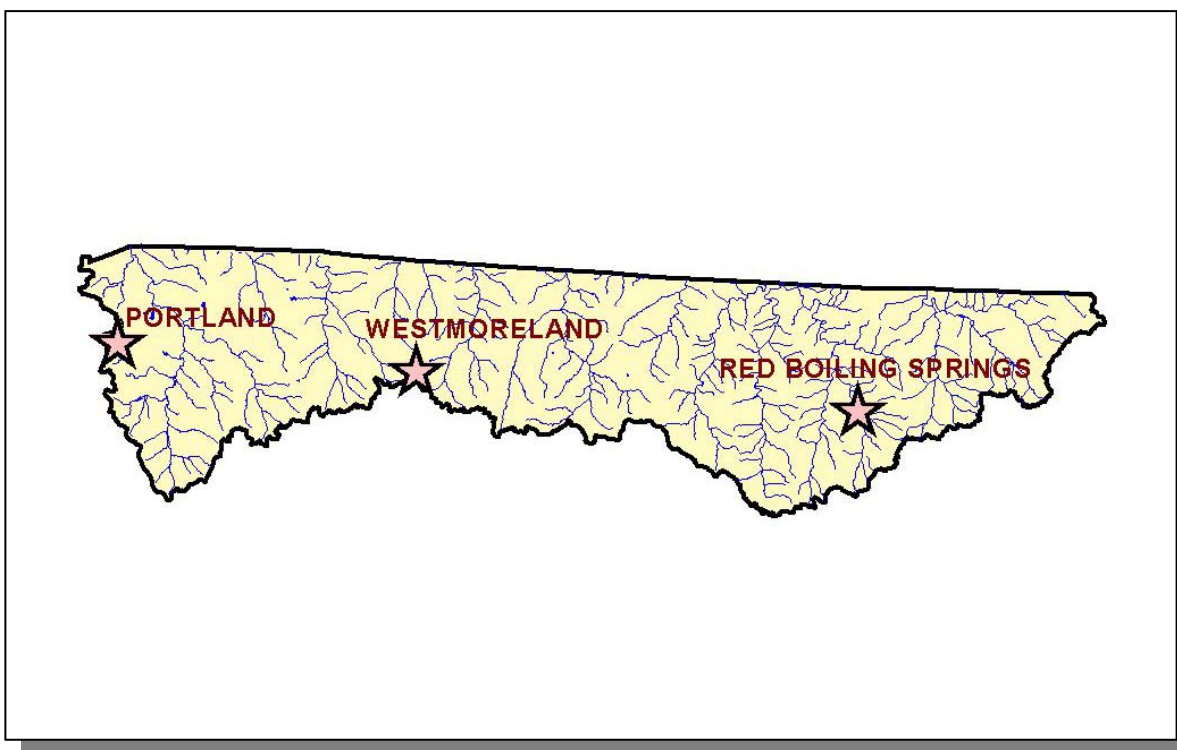


Figure 2-4. Hydrology in the Tennessee Portion of the Barren River Watershed. There are 563.2 stream miles and 45 lake acres recorded in River Reach File 3 in the Tennessee portion of the Barren River Watershed. Location of Portland, Red Boiling Springs, and Westmoreland are shown for reference.

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2.3.B. Dams. There are 12 dams inventoried by TDEC Division of Water Supply in the Tennessee portion of the Barren River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

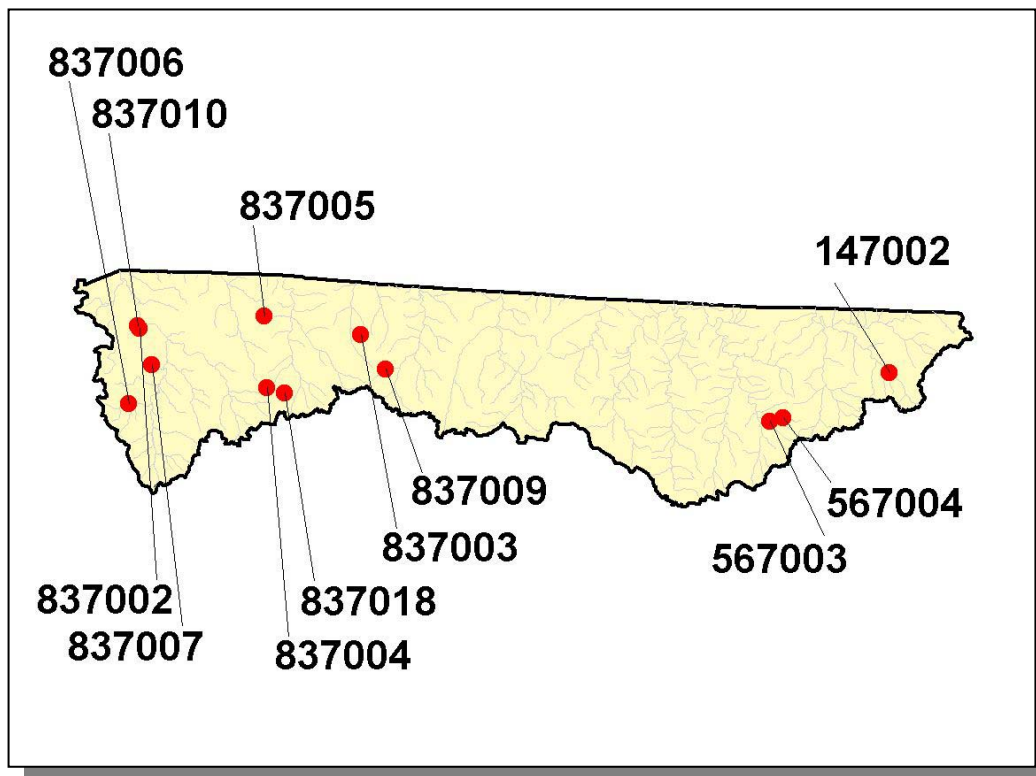


Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Barren River Watershed. More information is provided in Appendix II and at <http://gwidc.memphis.edu/website/dws/>.

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2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

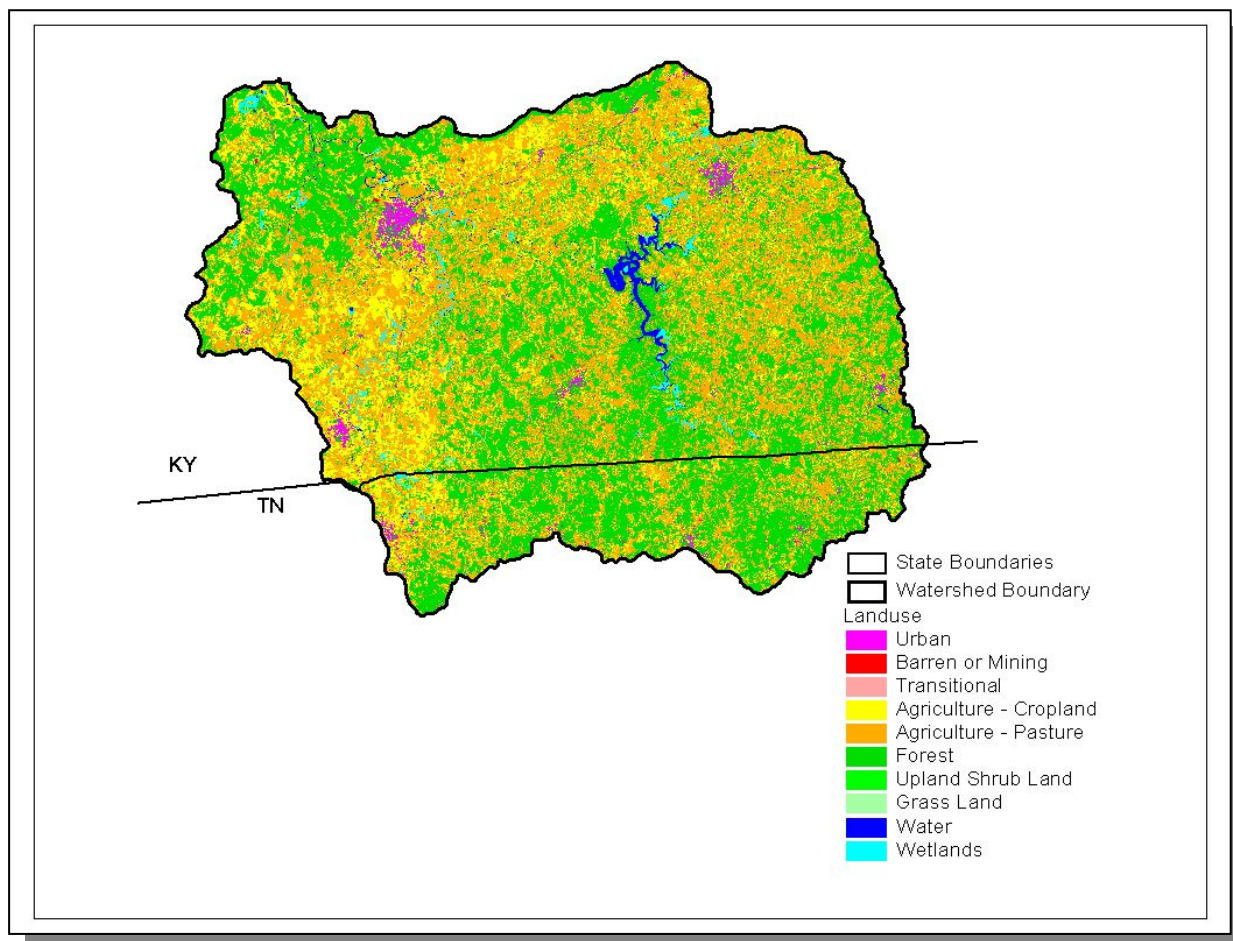


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

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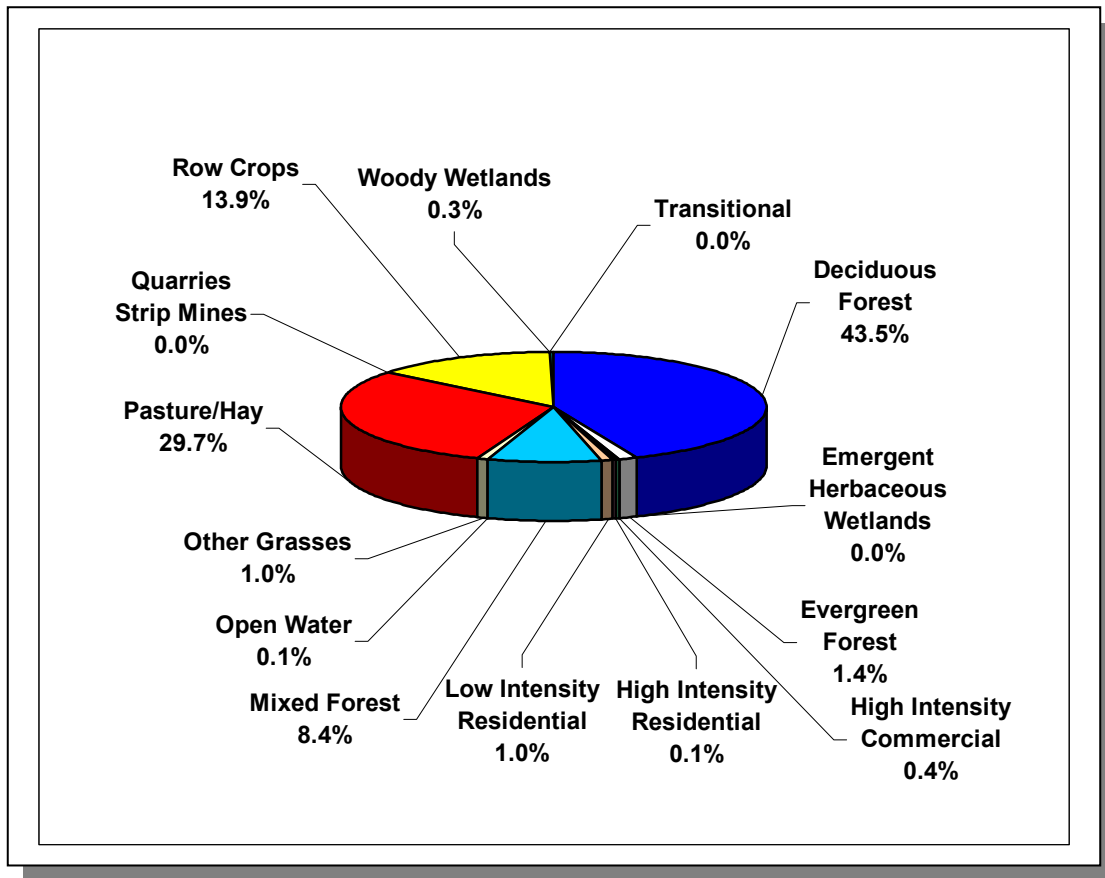


Figure 2-7. Land Use Distribution in the Tennessee Portion of the Barren River Watershed.
More information is provided in Appendix II.

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.

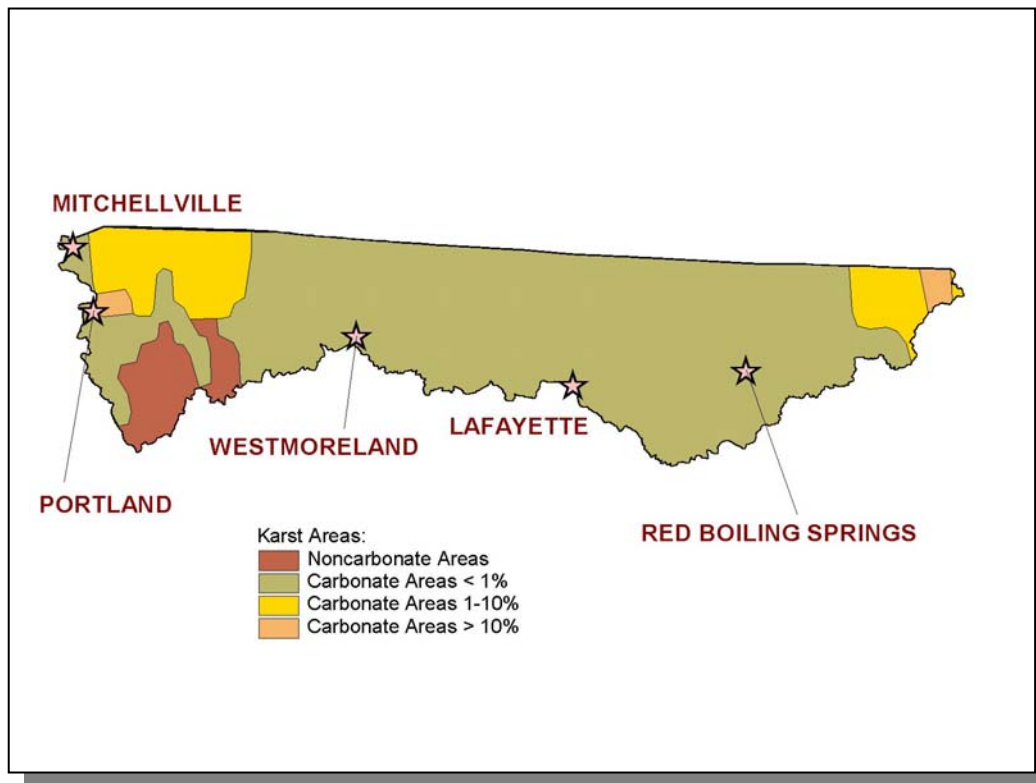


Figure 2-8. Illustration of Karst Areas in the Tennessee Portion of the Barren River Watershed. Locations of communities in the watershed are shown for reference.

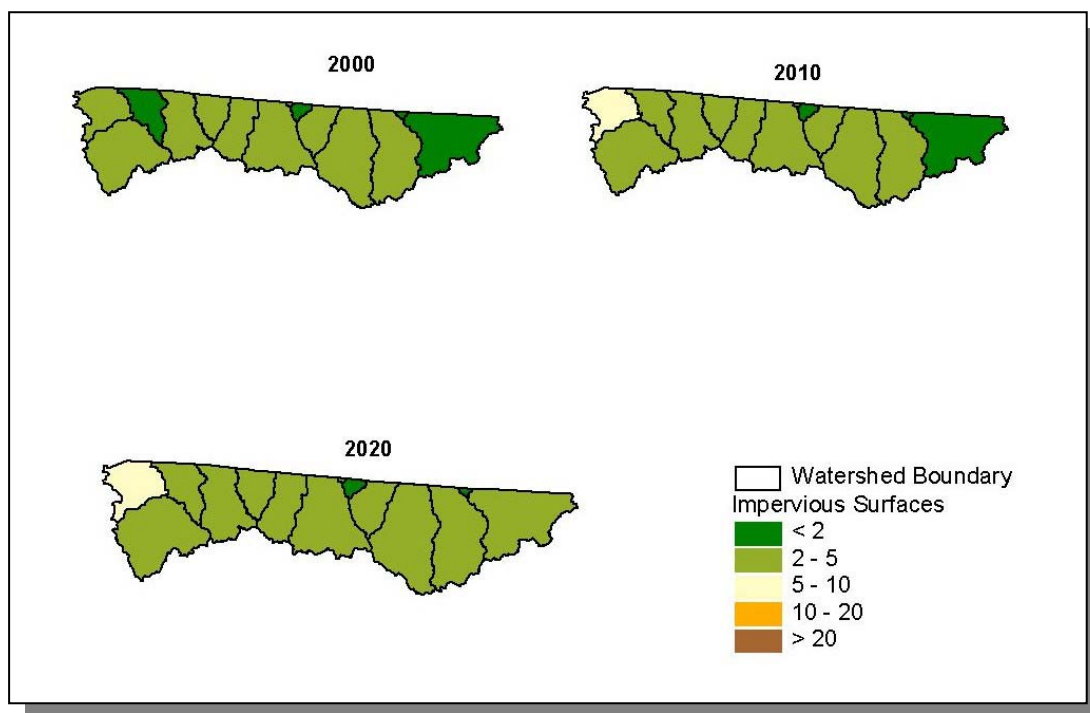


Figure 2-9. Illustration of Total Impervious Area in the Tennessee Portion of the Barren River Watershed. All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee portion of the Barren River Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 3 Level IV subecoregions:

- The **Western Pennyroyal Karst (71e)** is a flatter area of irregular plains, with fewer perennial streams, compared to the open hills of the Western Highland Rim (71f). Small sinkholes and depressions are common. The productive soils of this notable agricultural area are formed mostly from a thin loess mantle over residuum of Mississippian-age limestones. Most of the region is cultivated or in pasture; tobacco and livestock are the principal agricultural products, with some corn, soybeans, and small grains. The natural vegetation consisted of oak-hickory forest with mosaics of bluestem prairie. The barrens of Kentucky that extended south into Stewart, Montgomery, and Robertson counties, were once some of the largest natural grasslands in Tennessee.
- The **Eastern Highland Rim (71g)** has level terrain, with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions (68, 69) to the east. Bottomland hardwood forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.
- The **Outer Nashville Basin (71h)** is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

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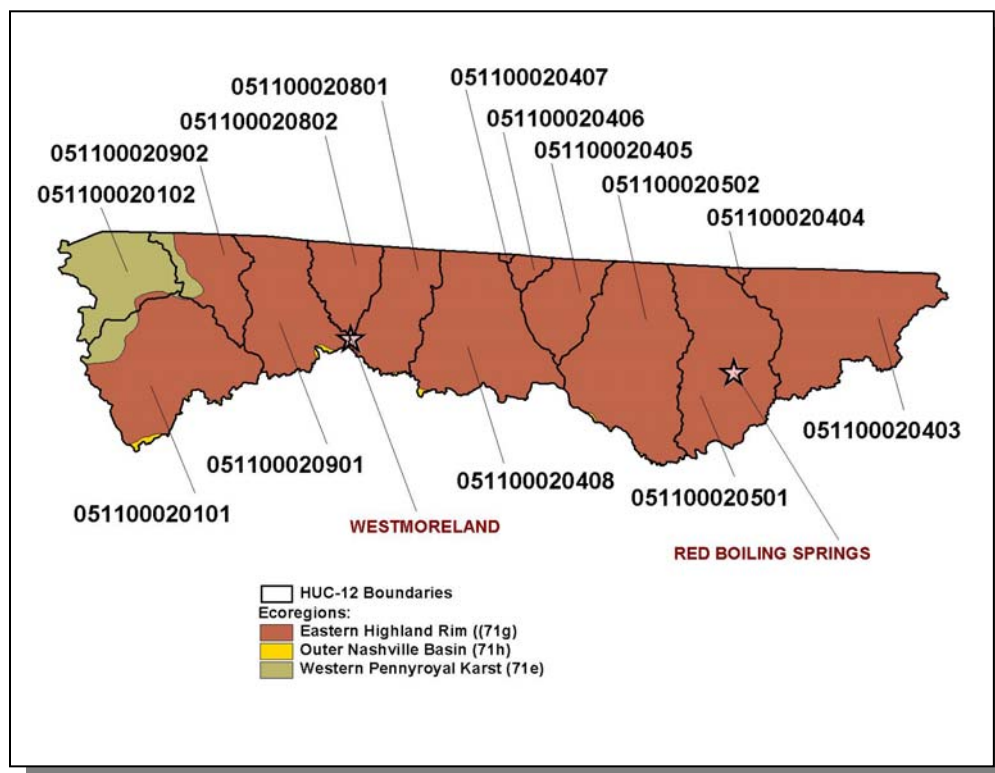


Figure 2-10. Level IV Ecoregions in the Tennessee Portion of the Barren River Watershed.
Locations of Red Boiling Springs and Westmoreland are shown for reference.

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Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

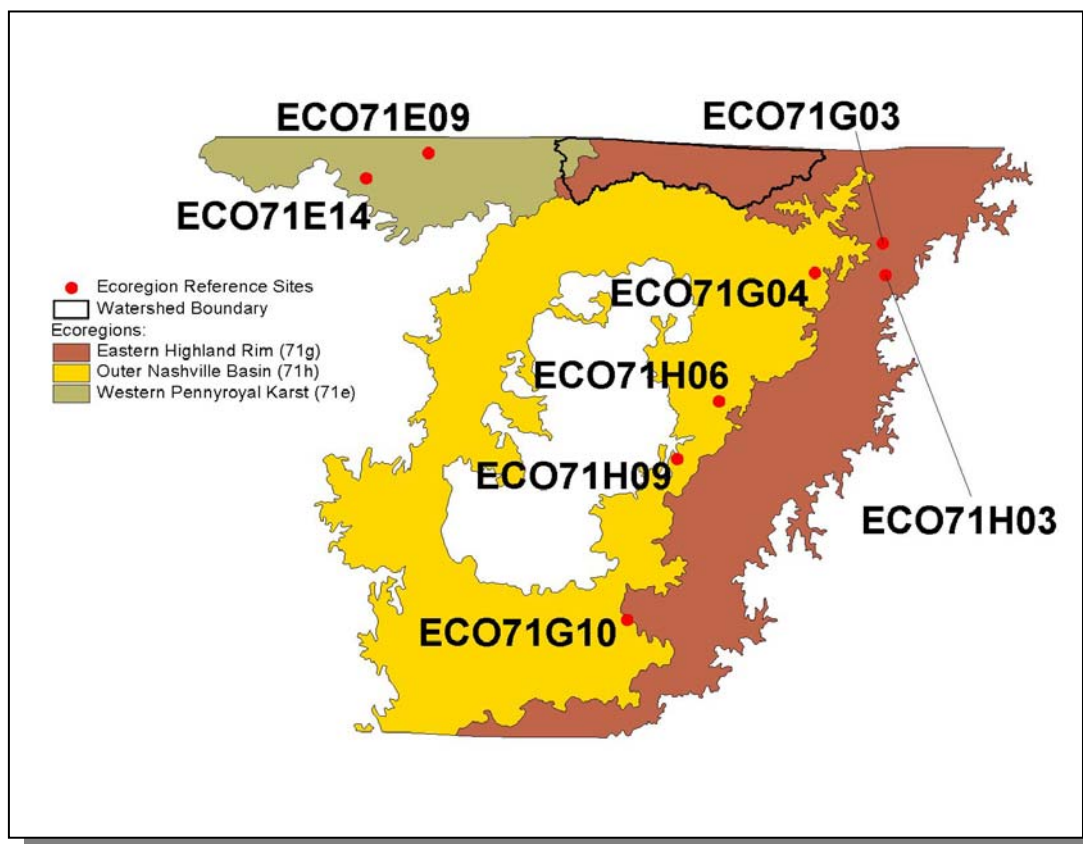


Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 71e, 71g, and 71h. The Tennessee portion of the Barren River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Insects	1
Snails	1
Birds	3
Fish	7
Total	12

Table 2-3. There are 12 Known Rare Plant and Animal Species in the Tennessee Portion of the Barren River Watershed.

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In the Tennessee portion of the Barren River Watershed, there are seven known rare fish species and one known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Etheostoma barbouri</i>	Teardrop darter		D
<i>Etheostoma barrenense</i>	Splendid darter		D
<i>Etheostoma bellum</i>	Orange-fin darter		D
<i>Moxostoma atripinne</i>	Blackfin sucker		D
<i>Notropis rubellus rubellus</i>	Rosyface shiner		D
<i>Percina macrocephala</i>	Longhead darter		T
<i>Percina strictogaster</i>	Blackfin darter		D
<i>Carychium stygium</i>	Cave thorn		

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Barren River Watershed.
State Status: T, Threatened; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.

2.6.B. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/nh/wetlands/>

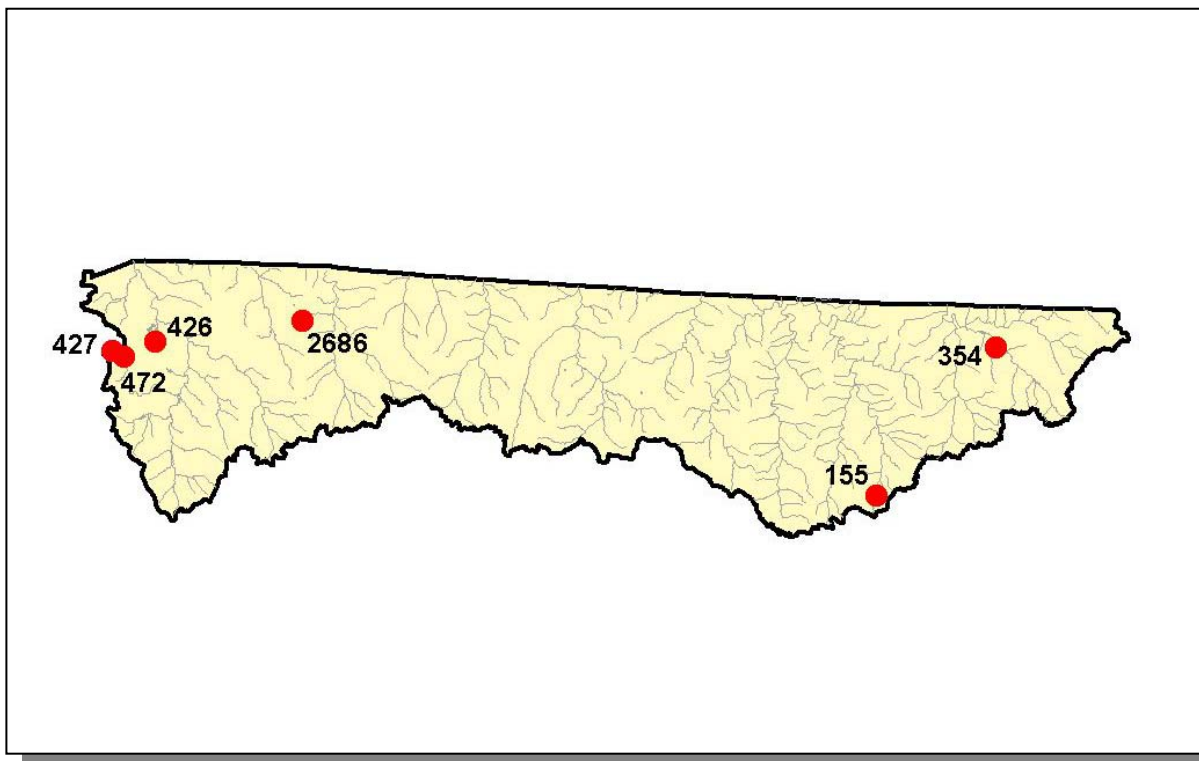


Figure 2-12. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Tennessee Portion of the Barren River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information is provided in Appendix II.

2.7. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bean Branch Creek	3			Long Fork Creek	1	2	
Big Trammel Creek	3			Long Hungry Creek	1	2	
Caney Fork Creek	3			Middle Fork Drakes Creek	3		1,2
Dutch Creek	3			Puncheon Creek	2		
Garrett Creek	3			Salt Lick Creek	1	2	2
Line Creek	3			Sulfur Fork Creek	3		
Little Trace Creek	3			Trace Creek	3		
Little Trammel Creek	3			West Fork Drakes Creek	2,3		1
Long Creek	3			White Oak Creek	3	2	2

Table 2-5. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed